(No Model.)

425-806 R

A. C. ESTABROOK.

MANUFACTURE OF BRUSHES.

No. 278,660. Patented May 29, 1883.

~~18~~ FLASH DIGEST ~~18 DIG. 18~~

Fig. 1.

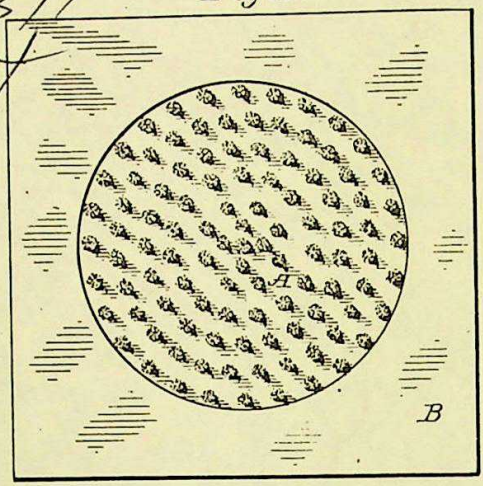


Fig. 2.

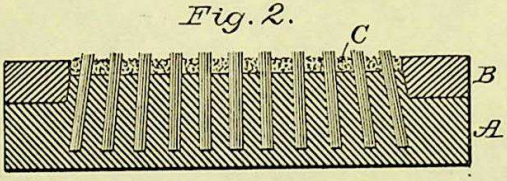
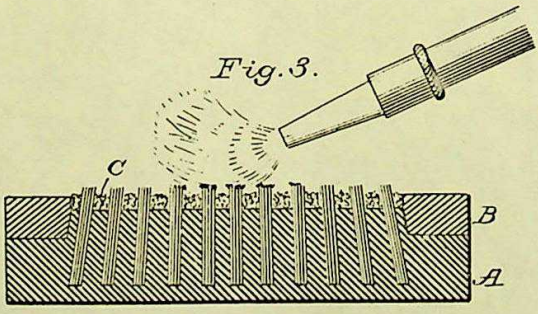


Fig. 3.



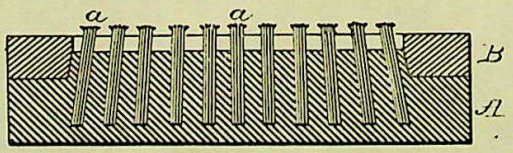


Fig. 4.

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UNITED STATES PATENT OFFICE.

ALANSON C. ESTABROOK, OF FLORENCE, MASSACHUSETTS, ASSIGNOR TO THE FLORENCE MANUFACTURNG COMPANY, OF SAME PLACE.

MANUFACTURE OF BRUSHES.

SPECIFICATION forming part of Letters Patent No. 278,660, dated May 29, 1883.

Application filed December 13, 1882. (No model.)

To all whom it may concern:

Be it known that I, ALANSON C. ESTABROOK, of Florence, in the town of Northampton, county of Hampshire, and State of Massachusetts, have invented certain new and useful Improvements in the Manufacture of Brushes; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of the several features of my invention.

The object of said improvements is to provide for a better union of the tufts of bristles with the solid back to which they are united than has, as I believe, been practicable to obtain prior to my said invention; and my said improvements have a special value in connection with and are limited to that well-known class of brushes which involve the embedding of the bristles in plastic material which subsequently hardens.

My invention, consists, mainly in a novel method of developing upon the tufts of bristles a singed head or heads at the inner ends thereof. It is to be understood that I am well aware of the suggestions contained in United States Letters Patent No. 20,226, issued May 11, 1858, to J. H. Tatem, as to the securing by singeing of bristles separately and permanently inserted into a back-plate of a brush, said plate having been previously perforated or drilled to receive them, and also that said patent recites said method of securing said separate bristles as an alternative with or to the use of cement for the same purpose; and I am also aware of the long practiced method of giving to the inner ends of brush-bristles a rectangular bend, with a view to their better retention in their settings, and also of the dipping of said ends in glue or other adhesive matter; but, so far as my knowledge extends, I am the first to singe the inner ends of the tufts of bristles, whereby, when set in place and the heads developed by singeing and embedded in the plastic material as in a finished brush of the character referred to, they cannot well be withdrawn even by special effort, and they are therefore practically free from liability of displacement during the use of the brush. I develop these artificial heads on the tufts of bristles by the action of heat, as from a heavy spreading flame of gas, while the adjacent portion of the bristles is protected, and in such a manner that the ends only of the bristles are singed or seared sufficiently to melt them, and thereby to form the strong integral heads desired. It is obviously essential that the action of the heat or flame should be so limited that only the extreme inner ends of the bristles should be affected thereby, and I have therefore provided for so shielding the main portion of the bristles that only the proper portions thereof will be affected by the heat or flame, as is desired for my purposes.

To more fully describe my invention, I will refer to the accompanying drawings, in which Figure 1 is a top view of a set of bristles as they are usually set up in a block for producing a circular brush having a composition back. Fig. 2 is a lateral vertical section of the same with a protecting shield added thereto, preparatory to developing heads on the bristles. Fig. 3 is a similar view with the heading-flame applied to the bristles. Fig. 4 is a view of the same with the protecting-shield removed.

The manufacture of brushes involving the embedding of the bristles in a plastic material which subsequently hardens involves the use of a base-block, A, provided with a complete series of holes of proper size and depth to receive the tufts of bristles, substantially as shown and described in the Letters Patent issued to me June 19, 1866, reissued October 19, 1869, No. 3,676. I also employ upon top of the said base-block a ring-plate, B, having an opening in the center corresponding to that portion of the base-block which is drilled, and into the holes of which the tufts of bristles are inserted. Suitable dowels and holes enable the proper location of the ring-plate upon the base-block. The thickness of this plate B is slightly greater than the length of that portion of the bristles which is to be embedded in the plastic material.

As seen in Figs. 2 and 3, I employ a detachable protecting-shield, C, which protects the bristles, except at their ends, from the action of a flame, preferably applied through a blow-pipe; or, in lieu thereof, a piece of metal may be used, if so heated that when placed closely to the bristles it will cause them to

melt, and thereby develop the desired heads *a*. This shield C also protects from smoke and grease the upper surface of the base-block, which usually subsequently serves as a part of the die used for completing the brush. Said shield may be composed of thin sheet metal in the form of a properly-perforated plate; but that would involve either holes so large for the tufts with their heads to pass freely through when the plate was lifted, or the reinsertion of each tuft carefully into a die-block preparatory to the application of the plastic material or compound; or said shield in many cases can be composed of narrow strips of metal, with recesses at each edge, so that when placed side by side coincident recesses would be occupied by a tuft of bristles; but while these plates will serve the purpose desired, so far as relates to the protection referred to, they will involve much labor, which I can economize by the use of the shield which is preferred by me—viz, a layer of sand or silex, granulated glass, or other granulated matter which is readily maintained in a dry, loose, or fluid-like condition, and not readily affected by heat. I prefer dry sand, which is poured at the center of the ring-plate B, and thereafter the bristles are properly and uniformly exposed by passing a soft brush over the surface of the sand. After the searing of the bristles the ring-plate is removed, the sand poured off into a receptacle, and the die-block brushed off clean in and around the bristles with a soft brush, care being taken, of course, not to unduly disturb the heads or to separate those which have become welded or joined to others by the searing operation.

It is obvious that, in the manufacture of that class of brushes which are composed in part of plastic material, and embody also a perforated plate in which the tufts of bristles are mounted, the ring-plate and protecting-shield, whether the latter be of sand or otherwise, can be used as with the die-block A; and it is equally obvious that said sand-shield may be successfully employed in the manufacture of that class of brushes which embody a perforated plate composed of plastic material hardened, bored, and thereafter, with the bristles in place, united to the plastic material which constitutes the main portion of the brush back or handle.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The process of developing heads on tufts of bristles for brushes, involving the use of plastic material, substantially as hereinbefore described, by first setting up a series of tufts of bristles into the positions to be occupied by them in a brush, then applying a shield to all of said tufts for protecting them adjacent to their inner ends, then searing or singeing said bristles, and finally removing the shield for permitting the application of the plastic material.

2. The apparatus for developing integral heads upon bristles or tufts of bristles, consisting of the combination of the base-block, ring-plate, and protecting-shield, substantially as described.

3. The combination, with the base-block and the ring-plate, of a protecting-shield composed of loose granulated material, substantially as described.

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Witnesses:

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